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size the implant parts as described herein to better correspond to patient specific anatomy and that will integrate better into the human body.

The patient-specific customization also applies to the anchor and/or the intermediate part. The anchor and intermediate part may be provided with particular dimensions or shapes to correspond to the dimensions of a bore at a patient's implant site. The anchor and any apical threads may be designed on a case-by-case basis also. For example, a clinician may want a modular implant with no apical threads. Further, the clinician may want the implant (the head, intermediate part, and anchor) to be made entirely of porous material or another material. Exterior surfaces on the intermediate part and anchor may also be customized as mentioned above.

With the structures described above, and whether or not stock parts or customized parts are used, the doctor is able to select a desired form for at least one of the head, the intermediate part, and the anchor for the modular implant, and make the selection specifically for a particular examined patient site to receive the modular implant. In one case, the form of each of the head, intermediate part, and the anchor are selected specifically for the particular examined patient site, and yet in another case, stacking pieces are also used on the implant and selected with the particular patient site in mind.

As another option, at least one of the head, the intermediate part, and the anchor is customized for a particular patient to receive the modular implant. In some of these cases, at least one of the parts may be a non-customized stock part.

If the clinician decides to assemble and place the implant chair-side, another feature of the modularity is to be able to place the anchor with or without the intermediate part first, place a healing screw, and cover it over for healing while a patient-specific implant head is being manufactured. When the patient-specific implant head is completed, the clinician can then revisit the surgical site, remove the healing screw, and attach the customized patient-specific implant head. In this situation, the implant is assembled in-vivo and is designed and customized specifically for a particular patient's bone and soft tissue anatomy.

Also, a modular implant can have the advantage of easier replacement or revision in certain cases if the implant fractures or otherwise fails. In this situation, instead of having to remove and replace the entire implant, the clinician may only need to remove and replace the head, where most fractures or failures would generally occur. In this way, the anchor and the intermediate part remains completely osseointegrated and stable during and after replacement of the head while the tissue heals.

While the illustrated forms are shown to be dental implants, it will be understood that such structures, with modular implants with interchangeable parts as described above and where an intermediate part is secured to the implant by a head and an anchor, may be applied to implants used on other areas of a human or animal body.

While this invention has been described as having a preferred design, the present invention can be further modified within the spirit and scope of this disclosure. This application is therefore intended to cover any variations, uses, or adaptations of the invention using its general principles. Further, this application is intended to cover such departures from the present disclosure as come within known or customary practice in the art to which this invention pertains and which fall within the limits of the appended claims.

What is claimed is:

1. A modular dental implant kit, comprising:

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a head configured for supporting a dental prosthesis, the head defining a generally cylindrical apical end, the apical end having an exterior threaded portion configured for engaging bone;

an intermediate part configured for engaging bone and including a porous sleeve defining axially opposed ends and having passages through the sleeve configured for receiving bone ingrowth;

an anchor configured to engage the head so that at least the head and the anchor cooperatively secure the intermediate part to form a modular implant, the anchor defining a generally cylindrical coronal end, the coronal end having an exterior threaded portion configured for engaging bone; and

a core configured to extend axially through an interior of the porous sleeve and configured to fasten the head and anchor together such that the head and anchor abut respective opposed ends of the porous sleeve to axially encase the sleeve about the core, wherein at least one of the sleeve and the exterior threaded portions of the head and the anchor are configured to promote osseointegration of the modular implant.

2. The modular dental implant kit of claim 1, comprising a plurality of heads having a plurality of different head forms, the plurality of head forms including:

a bone-level head with a coronal end configured to be disposed at a crest of a mandible or a maxilla;

a transgingival head with a coronal section configured to extend through gingiva; and

a one-piece implant head comprising a portion configured for engaging the intermediate part and having an integral abutment formed thereon.

3. The modular dental implant kit of claim 1, comprising a plurality of heads having a plurality of different head forms and a plurality of anchors having a plurality of different anchor forms, wherein the plurality of head and anchor forms each include a different material.

4. The modular dental implant kit of claim 3, wherein each of the plurality of different head forms includes at least one of:

titanium,

zirconia,

an aesthetic material,

a composite material,

a surface coating,

micro threads,

a polished collar, and

a biological coating.

5. The modular dental implant kit of claim 3, wherein each of the plurality of head forms is configured to be assembled on at least one of the plurality of anchor forms.

6. The modular dental implant kit of claim 1, wherein the intermediate part is at least partially formed from one or more of:

a metal including niobium,

a cobalt alloy metal,

a metal including tantalum,

a ceramic,

a biological coating,

a polymer,

a resorbable filler,

a non-resorbable filler,

an organic bone graft,

a synthetic bone, and

a collagen.

7. The modular dental implant kit of claim 1, comprising a plurality of intermediate parts having a plurality of different